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| 10/807,302 | 03/24/2004 | Satoshi Masumi | 08830.0016 | 3817 |
| 22852 7590 12/11/2007 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER LIANG, LEONARD S | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/807,302 | Applicant(s) MASUMI ET AL. | |
| | Examiner Leonard S. Liang | Art Unit 2853 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-17, 22, 24-26, 28-39 and 41-47 is/are pending in the application.
- 4a) Of the above claim(s) 1-11, 13-17, 22 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25, 26, 28-39, 41, 42 and 44-47 is/are rejected.
- 7) ☒ Claim(s) 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

12/07/07
LSL

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

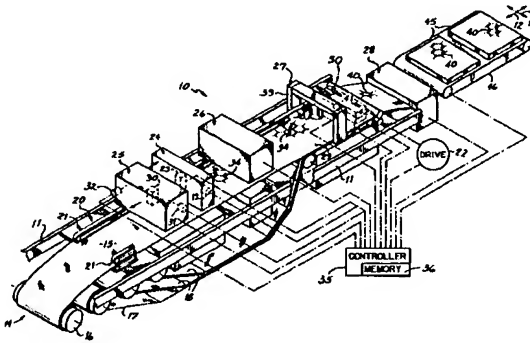
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25-26 and 28-39, 41-42, and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al (US Pat 6312123) in view of Muranaka (US Pat 6004052) and Wile et al (US Pat 4517893).

Codos et al discloses:

- {claim 25} An image recording device (fig 1); a recording head which discharges an ultraviolet-ray curable ink, which is cured as irradiated with ultraviolet rays (figure 1, reference 25); an ultraviolet light source which generates ultraviolet rays to cure the ultraviolet-ray curable ink (figure 1, reference 24); a first heating section which heats the ultraviolet-ray curable ink on a recording medium after an irradiation of the ultraviolet rays (figure 1, reference 26); a pressure section which pressurizes the recording medium after an irradiation of the ultraviolet rays (reference 44 in column 4, lines 17-20)



- {claim 36} a moving section which moves the recording medium relative to the first heating section (figure 1, reference 20; column 3, line 56-column 4, line 5)
- {claim 41} wherein the ultraviolet-ray curable ink is a water-base ink (column 1, lines 55-56)
- {claim 45-47} wherein the recording condition includes at least one of a type of the ink, period of time required for discharging the ink from the recording head, and a discharge amount of the ink from the recording head (abstract)

Codos et al differs from the claimed invention in that it does not explicitly disclose:

- {claim 25} a second heating section which heats the recording medium before a heating process of the first heating section; a controller which controls the first heating section to start heating the ultraviolet-ray curable ink on the recording medium after the last discharge of the ink to an arbitrary area on the recording medium, a first predetermined time between the last discharge and the starting heat is predetermined, and controls the first heating section to heat the ultraviolet-ray curable ink

within a second predetermined time in a range between 0.1 and 10 seconds

- {claim 26} wherein the first predetermined time is in a range between 0.1 and 120 seconds
- {claim 28} wherein the controller changes a heat quantity, which is applied to the ink by the heating section, in accordance with kinds of recording medium to be recorded
- {claim 29} wherein the controller changes the second predetermined time in accordance with kinds of recording medium to be recorded
- {claim 30} wherein the controller changes the first predetermined time in accordance with kinds of recording medium to be recorded
- {claim 31} wherein the controller changes a heat quantity, which is applied to the ink by the heating section, in accordance with recording conditions
- {claim 32} wherein the controller changes the second predetermined time in accordance with recording conditions
- {claim 33} wherein the controller changes the first predetermined time in accordance with recording conditions
- {claim 34} wherein the heating section is used as the pressure section
- {claim 35} wherein a heating process of the heating section and a pressurize process of the pressure section are overlapped
- {claim 37} a pair of rollers which moves the recording medium to the first heating section, wherein one of the rollers is used as the heating section, and the other is used as the pressure section

- {claim 38} a roller and a belt which move the recording medium to the first heating section, wherein one of the roller and the belt is used as the heating section, and the other is used as the pressure section
- {claim 39} a pair of belts which moves the recording medium to the first heating section, wherein one of the belts is used as the heating section, and the other is used as the pressure section
- {claim 42} wherein the second heating section heats the recording medium before a recording process of the recording head

Codos et al discloses:

- {claims 25-26 and 28-33) a controller (fig 1, ref 35) which includes a memory for storing programmed patterns, machine control programs and real time data regarding the nature and longitudinal and transverse location of printed designs on a web and the relative longitudinal position of the web (column 4, lines 44-52) and which can be used to control heating and curing of substrates of different thicknesses so that ink on the substrate is maintained at about 300° F for up to three minutes and the heating ranges from 30 seconds to 3 minutes to make sure ink adequately penetrates the depths of the substrate (column 5, lines 15-34)

Muranaka discloses:

- {claim 25} a second heating section which heats the recording medium before a heating process of the first heating section (figure 5, reference 2-3, 27, and 29; column 7, lines 12-18)

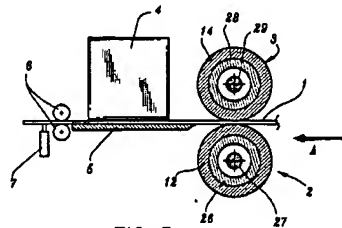


FIG. 5

- {claim 37} a pair of rollers which moves the recording medium to the first heating section, wherein one of the rollers is used as the heating section, and the other is used as the pressure section (figure 5, reference 2-3, 27-29)
- {claim 38} a roller and a belt which move the recording medium to the first heating section, wherein one of the roller and the belt is used as the heating section, and the other is used as the pressure section (naturally suggested in view of figure 5 and column 2, lines 7-12, which teaches the possible use of belt)
- {claim 39} a pair of belts which moves the recording medium to the first heating section, wherein one of the belts is used as the heating section, and the other is used as the pressure section (naturally suggested in view of figure 5 and column 2, lines 7-13)
- {claim 42} wherein the second heating section heats the recording medium before a recording process of the recording head (figure 5)

Wile et al discloses

- {claim 25} wherein the second predetermined time is in a range between 0.1 and 10 seconds (column 9, lines 41-47)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the control system of Codos et al. The motivation for

the skilled artisan in doing so is to gain the benefit of controlling the various elements of the printing system. The combination naturally suggests:

- {claim 25} a controller which controls the first heating section to start heating the ultraviolet-ray curable ink on the recording medium after the last discharge of the ink to an arbitrary area on the recording medium, a first predetermined time between the last discharge and the starting heat is predetermined, and controls the first heating section to heat the ultraviolet-ray curable ink within a second predetermined time
- {claim 26} wherein the first predetermined time is in a range between 0.1 and 120 seconds (because of proximity of heat station to print station)
- {claim 28} wherein the controller changes a heat quantity, which is applied to the ink by the heating section, in accordance with kinds of recording medium to be recorded
- {claim 29} wherein the controller changes the second predetermined time in accordance with kinds of recording medium to be recorded
- {claim 30} wherein the controller changes the first predetermined time in accordance with kinds of recording medium to be recorded
- {claim 31} wherein the controller changes a heat quantity, which is applied to the ink by the heating section, in accordance with recording conditions
- {claim 32} wherein the controller changes the second predetermined time in accordance with recording conditions
- {claim 33} wherein the controller changes the first predetermined time in accordance with recording conditions

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Muranaka into the invention of Codos et al. The motivation for the skilled artisan in doing so is to gain the benefit of removing moisture from the substrate before printing in order to reduce wrinkling or curving of the substrate. The combination naturally suggests:

- {claim 34} wherein the first heating section is used as the pressure section (because even though figure 5 in Muranaka shows the pressure section coming before printing, Muranaka also stands for the general principle that heating rollers can be used for drying and can thus also replace the current first heater shown in Codos et al)
- {claim 35} wherein a heating process of the first heating section and a pressurize process of the pressure section are overlapped

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the regular ink of Codos et al with the plastisol ink of Wile et al in order to achieve drying times in a range between 0.1 and 10 seconds. The motivation for the skilled artisan in doing so is to gain the benefit of maintaining image quality on fabric despite multiple washing cycles.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al (US Pat 6312123) in view of Muranaka (US Pat 6004052) and Buckwalter (US Pat 3881942).

Codos et al discloses:

- {claim 25} An image recording device (fig 1); a recording head which discharges an ultraviolet-ray curable ink, which is cured as irradiated with ultraviolet rays (figure 1, reference 25); an ultraviolet light source which

generates ultraviolet rays to cure the ultraviolet-ray curable ink (figure 1, reference 24); a first heating section which heats the ultraviolet-ray curable ink on a recording medium after an irradiation of the ultraviolet rays (figure 1, reference 26); a pressure section which pressurizes the recording medium after an irradiation of the ultraviolet rays (reference 44 in column 4, lines 17-20) (as applied to claim 25 above)

Codos et al differs from the claimed invention in that it does not explicitly disclose:

- {claim 25} a second heating section which heats the recording medium before a heating process of the first heating section; a controller which controls the first heating section to start heating the ultraviolet-ray curable ink on the recording medium after the last discharge of the ink to an arbitrary area on the recording medium, a first predetermined time between the last discharge and the starting heat is predetermined, and controls the first heating section to heat the ultraviolet-ray curable ink within a second predetermined time in a range between 0.1 and 10 seconds

Codos et al discloses:

- {claim 25} a controller (fig 1, ref 35) which includes a memory for storing programmed patterns, machine control programs and real time data regarding the nature and longitudinal and transverse location of printed designs on a web and the relative longitudinal position of the web (column 4, lines 44-52) and which can be used to control heating and curing of substrates of different thicknesses so that ink on the substrate is maintained at about 300° F for up to three minutes and the heating ranges

from 30 seconds to 3 minutes to make sure ink adequately penetrates the depths of the substrate (column 5, lines 15-34)

- {claim 44} wherein a heating temperature of the first heating section is within a range of 50 °C and 200 °C, thus satisfying the given formula

Muranaka discloses:

- {claim 25} a second heating section which heats the recording medium before a heating process of the first heating section (figure 5, reference 2-3, 27, and 29; column 7, lines 12-18)

Buckwalter discloses

- {claim 25} wherein the second predetermined time is in a range between 0.1 and 10 seconds (abstract)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Muranaka into the invention of Codos et al. The motivation for the skilled artisan in doing so is to gain the benefit of removing moisture from the substrate before printing in order to reduce wrinkling or curving of the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the regular ink of Codos et al with the ink of Buckwalter in order to achieve drying times in a range between 0.1 and 10 seconds. The motivation for the skilled artisan in doing so is to gain the benefit of shorter drying times.

Allowable Subject Matter

Claim 43 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 43 discloses "a third heating section which heats the recording medium after a heating process of the first heating section," which was not found, taught, or disclosed in the prior arts.

Response to Arguments

Applicant's arguments filed 08/06/07 have been fully considered but they are not persuasive.

The Applicant has argued that "one of ordinary skill in the art would not have been motivated to cure the...deficiencies of Codos et al. by modifying the Codos et al. device with the teachings of Muranaka." The basis of the Applicant's argument is that "While Muranaka may disclose the use of two heating elements, Muranaka fails to disclose a 'second heating section which heats the recording medium before a heating process of the first heating section,' as required by independent claim 25. As depicted in, for example, figure 5 and described in the corresponding written disclosure, rollers 2 and 3 act upon sheet 1 simultaneously. That is to say, neither roller 2, nor roller 3, applies heat before the other of rollers 2 and 3 applies heat to sheet 1."

The Examiner believes that the Applicant has misunderstood how Muranaka is being applied. The Examiner is not citing one of rollers 2 and 3 as the first heating section and the other roller as the second heating section. The primary reference of Codos et al already discloses a first heating section. What Codos et al lacks is a second heating section which heats the recording medium before a heating process of the first heating section. This is what Muranaka teaches. Both its rollers 2 and 3 can be seen as

part of this second heating section, which heats the medium before even a printing process, and therefore by incorporation, before the first heating section of Codos.

The Applicant further argues that Muranaka and Codos et al derive from nonanalogous arts. The Applicant specifically states, "There is no reason to suggest, and the Examiner has provided none, that one involved in printing fabric with UV light curable ink would have looked to ink jet printers to make modifications or improvements to UV ink printing devices." The examiner is particularly confused by this argument because in that very statement, the Applicant demonstrates the recognition that both Codos and Muranaka involve ink printing. Both pieces of art are directed to ink-jet printing and therefore belong to the same field of endeavor.

The Applicant next makes an argument with regards to Wile et al. The Applicant argues, "First, Codos et al would be rendered unsatisfactory for its intended purpose if the UV-curable ink was replaced with the plastisol ink of Wile et al., as proposed by the Examiner...On one hand, Codos et al. teaches using a combination of UV light and heat of about 300 °F to cure and dry UV-curable ink printed upon a fabric...On the other hand, Wile et al teaches that a temperature of 600-1000 °F is necessary to dry and cure plastisol ink...Thus, replacing the Codos et al. UV-curable ink with the Wile et al. plastisol ink would render the Codos et al. device unsatisfactory for its intended purpose since it would be unable to generate the requisite temperatures necessary for curing plastisol ink."

The Examiner does not find this argument persuasive for a number of reasons. First, the Applicant is making a temperature argument, but nowhere mentions temperature control in the claims in question (only new claim 44 mentions temperature

control and a different rejection using a different secondary reference besides Wile et al is given for that particular claim). Second, the Applicant's disclosure of the temperature ranges in Codos et al. is based on the main embodiment where the first heating section is a forced hot air blower. The Applicant's disclosure of the temperature range in Wile et al is based on Wile's disclosure of an infrared drying section. If Codos et al did not mention infrared drying, the Examiner would agree with the Applicant's arguments that Wile et al could not be combined with Codos et al. However, the abstract of Codos et al clearly discloses, "Forced hot air is preferably used to apply the heat in the oven, but other heating methods such as infrared or other radiant heaters may be used." Therefore, it is perfectly justifiable to incorporate the ink of Wile et al into Codos et al because the two references belong in the same field of art, which is printing ink on a textile and drying it.

The Applicant finally argues that the Examiner's conclusion of obviousness is based upon impermissible hindsight. In view of the detailed arguments above, it should be clear that this was not the case.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not


mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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MANISH S. SHAH
PRIMARY EXAMINER